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THE JOURNAL OF PHILOSOPHY
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A PROBLEM OF EVIDENCE IN RADICAL EMPIRICISM

IF one were inclined to derive light and solace from epigrams one might well say that the intellectual labors of the ordinary man consist in gathering facts and their evidences, while those of the philosophers are peculiarly identified with the task of learning the relation between facts and their evidences. Whether such a summary phrase tells the whole truth or not, at any rate it states a goodly part of it; for theories of knowledge and theories of existence have thus far been little more than theories of the relations obtaining between accepted or rejected facts and the grounds of their acceptance or rejection. Men accept certain things naïvely; in times of stress they search for justifications of their belief: finally, given the scheme of justification—to be called science, religion, logic, or even philosophy, according to the attitudes taken by men of different temperaments toward their final world views—the professional philosopher appears upon the scene, prepared to dissect the established systems of bolstered beliefs. And in the structural relation discovered between facts and their proofs he hopes confidently to find a fact profounder than any of those being scrutinized.

This hope and this procedure are found imbedded in the philosophical attitudes of modern thinkers, most conspicuously, though, in the thinking of genetic psychologists, humanists, pragmatists and radical empiricists. Not what men believe, but how they come to believe what they do, and the relation of beliefs to reasons—this is the great theme of to-day and of every day. And the reason for its greatness consists in its retroactive bearing upon human beliefs; knowledge about the peculiar conditions under which a belief comes to be evidenced for or against must, we are told, influence the belief itself. As confirmatory of this claim, one might readily cite the humanists' revelations of postulates and aver that any beliefs whose proofs appeal to these postulates in any way are thereby strengthened not one whit.

This matter of the postulates I do not choose to discuss here inasmuch as there is a somewhat profounder and more perplexing issue

raised in the case of the relation between facts generally and their empirical existence. This, too, has been viewed and treated as what may well be called the limiting case of the relation between facts and their evidences; in it, then, we may expect to find the controversial points whittled down to exceeding sharpness. The situation is as follows: The radical empiricist claims that 'while one part of experience leans upon another part, experience as a whole leans upon nothing,'—is self-sustaining, in short. Both physical and psychical orders are wholly inside of experience, therefore, being nothing other than experienced qualities standing in different sorts of relations to one another. This much is stated as conclusion. Turning to the reasons leading up to the above view, we find them all consisting in certain assumptions about the relation between facts and their evidences. The following illustrations will make this clear:

1. "Whatever terminates the chain of intermediary acts realizing or exemplifying a meaning was, because it now is, what the idea—the intended meaning—'had in mind.'" This assertion reduces to a declaration that what is actually meant by any given thought is identifiable with the demonstrable or demonstrated meaning. The demonstration consists, roughly, in giving concretely the tangible, empirical things meant. *The thing originally meant is a part and function of its own evidence,* we are informed.

2. For this reason apparently the second assertion is made, namely, that a thing and the sensation of it are identical. The supreme evidence of anything is, generally speaking, the evidence of the senses. What a thing is—means—is what it is sensed (perceived) *as.* In the ideal, limiting case of evidence there is no difference between the thing and the evidence of its nature and existence. Or, to use an old phrase with slightly altered meaning, a directly experienced thing is self-evident, or, better, self-evidencing. *The limit of evidence is the thing to be evidenced.*

3. Most significant, though, is the assumption involved in the arguments for the autonomy of experience and against the reality of transmentals. It has been noted by sundry radical empiricists and allied thinkers that every evidential fact, every confirmation or explanation of whatever degree of convincingness, is itself empirical. This has led its discoverers to declare that every fact is empirical and only empirical; all of which assumes that *the empirical character of all evidential facts, situations, objects, etc., constitutes an invariable part of the evidence.*

4. This assumption is often used by radical empiricist and subjectivist alike, notably in arguments against transmentals. For instance, we are told that every attempt to prove the possible existence

of transmentals leaves us in an endless regress. As soon as you assert your belief in a transmental you must either describe this by intelligible words or refer to immediate experience to signify what it is,—so we are told. Every time a new description or reference is made, a regress to new experiences is accomplished, and this must be repeated indefinitely.

The reader will readily recall many other familiar illustrations like these. Let us now look at the problem in the logic of evidence which appears in the above declarations. Is it true that the empirical character of evidential facts constitutes a new fact to be added, as further evidence, to these same evidential facts? Is it true that the empirical character constitutes evidence for or against any fact whatsoever?

Our answers to these questions may first be very general; we may say that it is logically possible that certain features of evidential facts may be wholly irrelevant to the matter to be evidenced. Thus, if all the testimony against an alleged criminal were delivered in English, this fact would not necessarily constitute evidence for or against the defendant. Again, if all the testimony of eye-witnesses to a deed came from blue-eyed persons, nothing would be gained from this coincidence. Generalizing, we may say that common features of evidential facts may or may not constitute evidence about the evidential value of these facts or about the thing to be evidenced. We must now inquire whether the particular feature of 'givenness' is or is not such evidence.

At the threshold of our problem we encounter another which, lackey-like, must be treated before we may go further. It is the problem of distinguishing description from evidence. Perhaps in this we may eventually find the master-problem disguised. The radical empiricist and his sympathizers are frankly engaged in describing the eddies, currents and fluids in the stream of consciousness; when telling what a given thing means they point out the particular kinds of experiences in which the fulfillment of the meaning terminates. Meaning is identified with fulfillment of meaning. In like manner, to tell what a thing is is to indicate certain embodying sensations and feelings. It is not enough to indicate the sensed or felt qualities, for these latter are inextricably bound up with the psychic states in and through which they appear; appearing quality and act of appearing are merely different aspects of one and the same pure experience. Granting this to be a correct description, which I think we may with some slight later qualification, are we free to follow the radical empiricist in his next step of giving both aspects in question the same logical rating as evidences for the autonomy of experience?

I feel sure that we are not at liberty to do this, and for the very obvious reason that a mere description, however accurate, proves absolutely nothing about the implications of the things described. Description bears the same logical relation to evidence that deduction bears to induction, roughly speaking. This is precisely the case when description is strictly internal (and hence abstract), the result being literally an analysis of the given and nothing more. The parts reached through analysis always have certain implications, *i. e.*, stand in certain definite relations to other objects; but the mere empirical presence of the parts does not constitute their external relations nor their internal structure. There is no need of citing cases to prove this point, for the most radical of empiricists will grant it. A description of the contents of a given empirical moment, therefore, simply indicates the evidencing facts, but is not itself evidence.[1] One fact is evidence for or against another one whenever the former is experienced somehow or other as involving the existence of certain peculiarities of the latter. This evidential relation itself has to be experienced, to be sure; but here, just as in the original instance, the relation is in no wise characteristically qualified by its own empirical existence. We might, with only a slight risk of misinterpretation, revive Kant's cry in a new form and say that *empirical* existence is not a predicate of objects.[2] This is substantially what the pragmatist means when he says that 'things are given in the most diaphanous medium imaginable.' Waiving momentarily the problem as to the influence a supposed medium might have upon mediated objects, we may probably succeed in inducing the pragmatist to admit that at least some of the mediated objects relate to one another with the most superb independence of the medium real or fancied.

In reply to all this the radical empiricist has a ready and effective remark. Every fact about which anybody can raise a discussion must *ipso facto* be experienced. In spite of all apparent independence in the variations of things with respect to their bare empirical existences, the hard truth still remains that this very independence so dear to the realist is known only in and through an experience. And with this unchallengable fact that independence itself depends upon

[1] It is understood here, of course, that description is merely non-evidential with reference to the described facts and their implications. It ought to go without saying that any description *as act* is itself a fact *of another order* and capable of having its own implications. This point will be dealt with in another connection later on.

[2] I would not have this construed too literally; the Kantian thesis rests upon a misconception about the nature of existence. Existence in the sense of possessing certain relations, being involved in *something else*, gives us a very different view from that held by Kant. The above allusion is more literary than literal.

experience in order to be known, the realist's house of cards tumbles to a purely empirical floor. This oft proclaimed fact is the one which has been hurled at the heads of transcendentalists since time immemorial; it is the ancient cry of the sensationalist, the idealist and the empiricist. It seems overwhelming, this proof that we can not jump out of our own skins. And yet I make bold to say that there never has been and—let us pray—never will be a philosophical dogma more equivocal, more misleading, more hopelessly corrupt than this crushing *credo* of our contemptuous contemporaries. If this be orthodoxy, then is truth of the devil. And if it be orthodoxy, it would be piety to squelch it.

The squelching, though, is so very simple that it runs the danger of being rejected as inadequate. It is, in brief, this: the empiricist is guilty of the most glaring *petitio principii*. All that he says is that, in order to know an object to be somehow independent of experience, this independence must be itself experienced. Nobody would care to waste breath in denying this crass tautology. Nobody has ever imagined that a certain thing, in order to be *known* as having a certain character, need not be known as having that character! In order to make the known thing identical with the knowing of it, the radical empiricist is forced to the pitiful makeshift of pleading that the thing is never *known* to have that character save when it is *known!* May the gods refrain from interrupting us here with bursts of laughter! The grand *finale* is yet to come. This startling fact gravely revealed to an audience expectant of portentous things is declared to be evidence for the hypothesis that nothing (experienceable) can be in any true sense independent of experience and, conversely, that experience as a whole leans upon nothing. After hearing this verdict of radical empiricism, I am sorely tempted to put the radical over the empiricism and call the root of the matter an irrational. For, in bare syllogistic form the theory reduces to this:

1. *A* stands in a certain relation only when it is in that relation.
2. Therefore the existence of *A* in that relation proves that *A* can not exist save in that relation.
3. *Suppressed minor premise:* That relation of *A* is *A's* only relation.

But this suppressed assumption is just what the radical empiricist supposes he has proved by his observations and analyses of experience. We are free now to turn loose his blood-brother, the humanist, upon him; the blood-brother will show his misguided relative, perhaps, that the autonomy of experience has been a postulate all the time and that the *bizarre* concatenation of facts and conclusions is

like a dachshund eating his own tail and deriving sustenance therefrom.

Let us leave the comedy to which we have been invited by alluring bill-boards. Turn to the precise formulation of the erroneous theory of evidence underlying the radical empiricist's hypotheses. Does that theory not reduce to the following postulates?

1. The common peculiarity of all evidential facts constitutes the real limit of the evidential function of these facts. In other words, *the genus determines the classes and genera to which its own members may belong. All evidential facts are ipso facto members of the genus, 'experiences.' This genus exercises a limiting control over its members in such a way that none of these can be members of some other genus (of the same or higher order).* Any implications of empirical facts which make these or other facts appear to be something more than members of the empirical genus are to be rejected as errors. From this follows, as a logical *postulate*, what the empiricist has advanced as a conclusion:

2. There can be no other equally inclusive genus. 'Empirical fact' is identical metaphysically with 'existence.'[3]

The ordinary man, after realizing the meaning of all this, feels justified in asking the radical empiricist where and how he has discovered this unique characteristic of the experience genus. Is there any evidence, even that of simple analogy, presented within experience which hints at this curious logical 'eminent domain'? The answer is apt to be negative, for both psychologist and biologist and naïf man agree that experience is, in some slightly understood manner, an outgrowth and function of something *not merely* empirical. If the radical empiricist accepts this hypothesis, is he not forced into the dilemma of saying either that experience can not be, quâ experience, an evidence of its own self-sufficiency or else that experience is essentially self-contradictory? Would not the horrors of Hegel warn him against this second horn? Would it not be necessary to confess, after all, that the bare empirical character of experienced things—far from proving either the omnipotence or the triviality of experience—is absolutely non-evidential (at least in our present problem)?

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[3] Let us not burden the radical empiricist with the paradox of self-representation here. Some of his partners in logical crime have shackled themselves with their own handcuffs by observing, in the above postulate, that 'existence' is itself a member of the genus 'experience' and that 'experience as a genus' reappears within the genus 'experience.' Then follows the delirium of philosophical mathematics and mathematical philosophy. Great are the penalties of little sins if these sins be in logic.

DISCUSSION

UNITY AND THE WORLD GROUND

MR. SCHILLER'S interesting treatment of the problem of unity in his article entitled 'Idealism and the Dissociation of Personality'[1] suggests a crying need for a more definite determination of the kind of unity we should attribute to the world ground. Small agreement exists among authors as to what are the essentials of this unity. It is said, idealism fails to secure a true, fundamental unity because of the extreme contrast between the unity as found in the finite mind and that claimed to be in the universal mind. A quotation from the above article will best serve to develop our purpose. It is said, "In a sane human mind the contents of its consciousness exist harmoniously together; they are not independent of, nor hostile to, each other; they succeed or even supplant each other without a pang, in a rational and agreeable way; even where there is what is metaphorically called a mental 'struggle,' the process is not painful to the contents, but if to any one, to the mind as a whole which feels the struggle and the distress. If, on the other hand, we conceive ourselves as thoughts of a universal mind, what a chaos we must think that mind to be! How strangely dissevered into units which seem independent and shut up in themselves! How strange that each of its thoughts should fight for its own hand with so little regard for the rest, and fight so furiously! How strange, in short, upon this hypothesis that the world should appear as it does to us!

On the face of the apparent facts, therefore, it can not be denied that the assertions of idealistic monism are not plausible. The world on the face of it looks like the outcome of a rough-and-tumble tussle between a plurality of constituents, like a coming together and battle-ground of a heterogeneous multitude of beings. It seems, in a word, essentially pluralistic in character. And if, nevertheless, we insist on forcing on it a monistic interpretation, does it not seem as though that monism could only be carried through on the lowest plane on which existences really seem to be continuous, *viz.*, as extended bodies in space? In other words, must not our monism be materialistic rather than idealistic?"

In analyzing this quotation one finds a striking variation in the criterions for unity. In what shall a metaphysical unity consist? For instance, shall we say that a harmonious togetherness is more of a unity than a distressing togetherness? If so, what kind of harmoniousness should we seek? But is not a fundamental unity

[1] This JOURNAL, August 30, 1906.

essential to any hostility? The absence of pain is surely not a greater proof of unity than the presence of pain. Does a rational and agreeable procedure possess the only patent right to final unity? Is even chaos possible except in a true unity? Disagreement as well as agreement, pain as well as joy, discord as well as harmony, chaos as well as order, if real, mean nothing if not included in some form of a real structural totality.

It is sometimes said that the world of facts exhibits only mutual changes or concomitant variations, but that in order to explain this fact we are impelled to assume a dynamic interaction of things; which interaction in turn implies a unitary self-sufficient world ground. This view arises from the notion that mutual variations in time are only formal relations, independent and separate from things and real only in particular minds; that the only real objective relation is dynamic determination. This is certainly a common scientific attitude, and a view-point of Lotze and Bowne. And yet our talk about the mutual change of the world of facts means nothing if not a reality of the facts, which again is as real an implication of the unity of the world as any dynamic interaction you might choose to have. The denial of interaction might imply the 'falling asunder into dynamically disconnected units,' but not into a totally disconnected plurality. Even a real plurality would mean nothing except as it expressed some form of a structural unity, at least of totality and exclusion.

Withness or togetherness is as true a unity as any unity you may choose. It is merely one that allows disjunction in the quality continuums of the content, in contrast to its extreme opposite type, which requires an absolute non-differentiation.

The problem of pluralism and of monism is not a problem of total disjunction *versus* non-differentiation, but a problem of the choice and implication of types of unity. What unity shall we consider final? What other forms of unity does it imply? For instance, it is quite possible that a mutual variation implies dynamic unity or that a withness implies a conscious unity of manifoldness which in turn may imply some form of dynamism. Whether that be so or whether experience demands that all things shall dynamically effect each other only externally, or whether a certain part of the world shall have a through and through dynamic active relation while other parts exhibit only external mutual changes, in any case it is a question of the implication of unities and of the consistent use of those implied.

In contrasting the unity of the finite mind with that of the infinite, the extreme difference in the unity of the contents of a finite

mind is pointed out as a discrepancy in the analogy of a universal mind. A struggle between the contents of a finite mind is said to be painful not to the contents, but to the mind as a whole. On the other hand, the universal mind must be one in which pain is pain to the content as well as to the whole mind. In what sense is it true that in a finite mind a struggle or pain is such only to the whole mind? In some sense a pain in one's arm can hardly be said to be painful in the color experience of the paper on the wall. It is not in the color experience of the paper on the wall nor in various other simultaneous experiences. It is clear that to say it is painful to the mind as a whole is to refer to one type of unity expressed in finite minds; a type to which, no doubt, we most often as personalities refer, but which is not the only meaning of wholeness that appeals in our life. When we say it is painful to the mind as a whole we refer to a unity of manifoldness; a unity of transcendence as illustrated in our perception of the extent of colored surface. When we emphasize the mutual isolation of experienced contents and thereby deny their presence in the mind as a whole, we refer to a type of unity which we may call a unity of quality continuums in the content; a unity that does not recognize transcendence, which, however, in reality may be there. This non-transcendent type of unity is most commonly experienced in our dealings with the physical world. Each of these types of unity plays equally forceful parts in our mental life, or we should never have had the strenuous opposition of sensationalism and spiritualism.

If we seek to analyze in what sense a finite pain or other experience is not a pain, etc., to the content, we find it becomes increasingly difficult to tell. The pain, though it be only a so-called state of a larger fact and though it be completely present to the manifold consciousness, nevertheless has an individuality of its own or it could not even be a state. An absolute dependence means an absolute non-differentiation; the type of unity sought by Plotinus, the mystic. Individuality may vary all the way from mere quality distinction to kinesthetic action and free will; from localized feeling to a manifold awareness as expressed in selves. Though we in normal life are directly aware of the higher forms of individuality to only a limited extent, yet even if we were directly aware of other free-will acts and feelings of other conscious selves, it is difficult to conceive our unity of manifoldness as essentially different in kind from that we now experience in relation to the qualities of perception. There would not be a unity of quality continuum through action, since there would be strife, nor in purpose, since there would be opposing ends, nor in desire, since there would be a difference

in meaning, but there would still be a unity of transcendence to which the contents would be also immediate facts. The contents in one sense would not be the universal fact any more than we could say the color space we perceive is we. And the Infinite in realizing our ignorance would not thereby become blind any more than we, in realizing the color or sound, become solely color or sound. The infinite unity, according to such a view, though realizing to the fullest the finite life, would not necessarily be exhausted therein. There would be practical usage in finite life for saying God and the world are one and God is not the world. The unity as thus described would be more than a material unity. A material unity is never a unity of manifoldness; it essentially neglects transcendence.

Suppose, though, one insists on a monism 'carried through on the so-called lowest plane on which existences really seem to be continuous, *viz.*, as extended bodies in space.' Suppose one proposes a materialistic monism. From an analytical point of view, how, after all, shall we differentiate this type of unity from the supposed higher idealistic unities? The limits of the article forbid more than arbitrary statements of our point of view. Three ideas seem commonly to be characteristic of space and matter. First, in space we have an extensive use of the identity of exclusion in which any part is presumed to be restricted to itself and which does not of itself have any reference aspect, either internally or to facts outside. This is commonly expressed by the assertion that space and matter are unconscious, dead facts. As one author puts it: "The law of space is the mutual externality of every part to every other." Second, there seems to be no finality or determinate organization of the portions of space or matter, *i. e.*, the divisions and the so-called relations of the parts of space and of matter seem absolutely arbitrary. Third, there seems to be no real aspect of wholeness from the point of view of space or matter as commonly viewed. Every unity ascribed appears to be formal and external. As Bradley puts it: "A space or a part of space that really means to be a solid is a self-contradiction. Anything extended is a collection, a relation of extendeds, which again are relations of extendeds, and so on indefinitely"; a statement not true of space as experience fact, but only true from a certain abstract point of view; a position which when realized implies not a breaking up of a unity into finer and finer pieces, but a total ceasing of all spatial fact, *i. e.*, the difficulty of space is not that of infinite divisibility nor that of infinite continuity, but the use of space as an ultimate limit of the notions of exclusion or indifference, arbitrariness and non-transcendence; notions detrimental to true unity.

However, what shall we say is the character of the unity obtained between the world mind and finite mind by the use of the concept of a changing threshold? Says Mr. Schiller: "It is clearly quite easy . . . to conceive individual minds as arising from the raising of the threshold in a larger mind, in which, though apparently disconnected, they would really all be continuously connected below the limen, so that on lowering it their continuity would again display itself, and mental processes could pass directly from one mind to another. Particular minds, therefore, would be separate and cut off from each other only in their visible or supraliminal parts, much as a row of islands may be really the tops of a submerged mountain chain, and would become continuous if the water-level were sufficiently lowered." A lowering of the threshold means a becoming conscious of. A raising of the threshold means a ceasing to be conscious of. Hence a raising of the threshold in the larger mind means a diminution of the consciousness of that mind, at the expense of which there appears presumably an increase of consciousness among the finites. What would the apparent disconnection thus mean? To whom would it be apparent? What, might we ask, would the real connection below the limen be? To what mind would it be a present real? If not to any, then evidently we fall short of idealistic monism. But shall we say the continuity found upon lowering the threshold is the same identical fact it was before it became an experience in some mind? If so, then evidently we are not contending for idealistic monism. But to identify experienced fact with non-experienced fact seems absurd. What, though, is our criterion of a mental fact? To be a mental fact seems to be a fact of consciousness, and when it is not a fact of consciousness it seems to be no fact of mind at all. A ceasing from the consciousness of the large mind would hardly mean a transference of that state to a finite mind. It would, indeed, be a puzzle to tell in what its reality consisted upon its severance from the large mind. It would be difficult, indeed, to show what its incorporation as a state of the little minds would mean. However, a lowering of the threshold in finite minds would clearly seem to mean an inverse change in the larger mind; a situation clearly at variance with fact as described by idealistic monism. By this inverse change in the consciousness of the finites and that of the universal mind a theoretical point might be reached by a lowering of the thresholds in all the finites, where the large mind would vanish altogether and pluralism would again be the problem; a situation hardly acceptable to idealistic monism. If it be said, a lowering of the threshold means simply an increase of knowledge and not necessarily an inverse relation as asserted above,

our problem is thereby merely proposed anew, for we have now to determine what kind of knowledge we mean.

The illustration of the row of islands would hardly satisfy idealism, for the plurality of the islands is an external plurality. Internally, according to the illustration, all finite minds would be as immediately conscious of the infinite mind as is the infinite of them. To whom would the water-level belong? Evidently we have here a dualism which idealism would fain accept. But in any case, is not the unity of the water and islands as true a unity as that of the submerged mountain chain?

J. H. FARLEY.

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THE MAD ABSOLUTE

MR. GORE, in this JOURNAL for October 11, tries very neatly to turn Mr. Schiller's joke on the absolute against the joker, and I suppose that those whom the latter gentleman's jokes vex are correspondingly content.

But are the tables turned?

It is *we* in our dissociated, finite shapes who are mad, says Mr. Gore, and not the absolute. The absolute in its integrated shape is the very beau ideal of sanity, and in our own successful quest of it, he adds, lies our only hope of cure. Get confluent with one another, restore the original unbrokenness of our infinitely inclusive real self, and the universe will wake up well.

But in the name of all that's absolute how did it ever get so sick? That we finite subjects are sick we know well enough, and no philosophy beyond the plainest lessons of our finite experience is needed to teach us that more union among ourselves would be remedial. But if all these distracted persons of ours really signify the absolute in a state of madness, why, how or when did it get mad? If it was ever sane, its friends ought surely to explain. Moreover, in that case must it be supposed that we have once for all superseded and abolished its primal wholeness, or does the wholeness still obtain entire behind the scenes, coexisting with our fragmentary persons, and, like another Sally Beauchamp, knowing about us all the while we know so little about it?

If the former alternative be the true one, we are back in the time-process and the mystery of a fall, reedited in these days by Messrs. Renouvier and Prat. Mr. Gore's monist puts the case in time-form, as a dramatic event, and seems to adopt this horn of the

dilemma. But another monist might consider this unorthodox, and insist that the absolute is 'timeless' and that it lives, Sally-like, alongside of our split-off selves.

But in this latter case what would be the significance of that reunion of these selves, from which, according to the absolutist philosophy, we are to hope for a cure? Is it to produce a second absolute, duplicating the first one? Or is it to be imagined as a reabsorption rather, with only the one indivisible primary absolute left? How ought we to conceive it at all? Reabsorption would seem inadmissible on absolutist principles. It would hardly go without the time-process; and would moreover be strongly suggestive of the cure of a disease *upon* the eternal absolute subject, much as an eruption may break out and be 'resolved' again upon one's skin. But the absolute can have no skin, no outside.

I doubt, therefore, whether Mr. Gore's monist has greatly helped his client's plight. Nor would it essentially mend matters for him simply to declare that the absolute is eternally three things—its pure identical self, the finite emanation or eruption and the reabsorption, all in one. And yet I believe that the path that Mr. Schiller and he have struck into is likely to prove a most important lead. The absolute is surely one of the great hypotheses of philosophy; it must be thoroughly discussed. Its advocates have usually treated it only as a logical necessity; and very bad logic, as it seems to me, have they invariably used. It is high time that the hypothesis of a world-consciousness should be discussed seriously, as we discuss any other question of fact; and that means inductively and in the light of all the natural analogies that can be brought to bear. No philosophy can ever do more than interpret the whole, which is unknown, after the analogy of some particular part which we know. So far, Fechner is the only thinker who has done any elaborate work of this kind on the world-soul question, although Royce deserves praise for having used arguments for analogy along with his logical proofs. I can not help thinking that Fechner's successors, if he ever have any, must make great use of just such cases as the one so admirably analyzed and told by Dr. Prince.[1]

WILLIAM JAMES.

HARVARD UNIVERSITY.

[1] Morton Prince, 'The Dissociation of a Personality.'

REVIEWS AND ABSTRACTS OF LITERATURE

Behavior of the Lower Organisms. H. S. JENNINGS. *Columbia University Biological Series,* X. New York: The Macmillan Co. 1906. Pp. xiv + 366.

This book is eminently worthy of the excellent series to which it belongs, for it is the most detailed, accurate and complete description, analysis and interpretation of the behavior of lower organisms in existence. More than this, the work stands alone, the first representative of a class of books in which animal behavior is to receive thoroughly scientific treatment.

This review consists of two parts: an objective statement of the contents of Professor Jennings's book and a subjective criticism and evaluation of the same.

The 'behavior of the lower organisms' is divided into three parts, of which the first presents an account of the activities of unicellular organisms, the second a description of the behavior of the lower metazoa, and the third an analysis of the facts of parts one and two with a discussion of certain theories of reaction. The materials of these three parts will be described in turn.

Part I. consists of descriptions of the structure, movements, reactions to stimuli and modifications in behavior of amœba, bacteria, paramecium and other infusoria. Amœba, it is shown, responds to all stimuli which influence higher animals. Its responses, which may be classified as positive reactions, negative reactions and food reactions, are determined as to the nature and direction of movement in part by the location of the stimulus, in part by the internal conditions of the organism. Unequal stimulation of the body causes movement toward or away from the source of the stimulus, whereas a condition of general stimulation induces an irregular contraction without definite movement. Adaptive movements are attained by a process of trial not unlike that seen in higher animals. Or as the author sums up the matter: "The stimulus induces movement in various directions (as defined by internal causes). One of these directions is then selected through the fact that by subjecting the animal to new conditions, it relieves it from stimulation. This is our first example of 'selection from among the conditions produced by varied movements,' —a phenomenon playing a large part, as we shall see, in the behavior of organisms" (p. 22). The reactions of amœba are not stereotyped, but instead vary greatly in correspondence with changes in the condition of the organism as well as in external conditions. There is good evidence of the modification of behavior by experience.

Bacteria are found to exhibit one simple reaction of preeminent importance,—the reversal of the direction of movement. This occurs whenever the organism chances to swim into the region of an unfavorable condition. A stimulus causes not a definitely directed movement away from the source of stimulation as occurs in amœba and in many other

organisms, but movement in various directions until finally the stimulus is avoided. Here, as in amœba, success is the result of trial movements, there is 'selection from among the conditions produced by varied movements.'

Paramecium, because of its structure, swims in a spiral course. It reacts to repellent stimuli in a perfectly regular way by swimming backward, turning toward a structurally defined side, the aboral, and then swimming forward in a new direction. If the stimulus be again encountered, the same reaction is repeated. It is important to note that after swimming backward for some distance, in the stimulus-avoiding reaction, paramecium moves so that its anterior end swings about in a circle and thus comes in contact with conditions all around the circle. Whenever a point is reached at which the stimulus is lacking, the organism moves forward in its usual manner. Thus there is a sort of trying or testing of the environment. In addition to the progressive movements of paramecium, many of which may be classed as positive reactions, and the avoiding or negative reactions just mentioned, there are two other forms of reaction: local contractions of the ectosarc and discharge of trichocysts. These latter reactions are relatively unimportant for, as the author points out, the 'action system' of paramecium consists essentially of the swimming in a spiral course, with its features of forward movement, revolution on the long axis, and swerving toward the aboral side. Variations in the relations of a few definite simple movements result in the behavior of this organism.

Professor Jennings gives the following vividly drawn picture of the daily life activities of a paramecium: "An individual is swimming freely in a pool, parallel with the surface and some distance below it. No other stimulus acting, it begins to respond to the changes in distribution of its internal contents due to the fact that it is not in line with gravity. It tries various new positions until its anterior end is directed upward, and continues in that direction. It thus reaches the surface film. To this it responds by the avoiding reaction, finding a new position and swimming along near the surface of the water. Now there is a strong mechanical jar,—some one throws a stone into the water, perhaps. The paramecium starts back, tries certain new directions, and finishes by reacting to gravity in the reverse way from its former reaction; it now swims downward. But this soon brings it into water that is notably lacking in oxygen. To this change it responds as before, trying new conditions till it has come near the surface again. Swimming forward here, it approaches a region where the sun has been shining strongly into the pool, heating the water. The paramecium receives some of this heated water in the current passing from the anterior end down the oral groove. Thereupon it pauses, swings its anterior end about in a circle, and finding that the water coming from one of the directions thus tried is not heated, it proceeds forward in that direction. This course leads it perhaps into the region of a fresh plant stem which has lately been crushed and has fallen into the water. The plant juice, oozing out,

alters markedly the chemical constitution of the water. The paramecium soon receives some of this altered water in its ciliary current. Again it pauses, or if the chemical was strong, swims backward a distance. Then it again swings the anterior end around in a circle till it finds a new direction from which it receives no more of this chemical; in this direction it swims forward" etc. (p. 104).

In chapters dealing with the behavior of other infusoria important differences in the activities of members of this group of unicellular organisms are discussed. And, as paramecium is relatively unresponsive to photic stimulation, the reactions to light of stentor and euglena are described in detail. In these organisms reactions to light are caused by changes in the intensity of illumination, and the stimulus is avoided by trial of different directions of movement.

The reactions of infusoria to the electric current differ in principle from those to most other forms of stimulation in that the organism does not try different directions of movement in what appears to be a search for a certain environmental condition, but instead moves now in one way, now in another according to the strengths of action of the current upon the motor organs of different parts of the body. While admitting that it is purely a laboratory product, the author sees fit to describe and discuss the reaction to electric currents and the theories of this reaction in considerable detail.

The presentation of facts of behavior of Part I. is concluded by a chapter on the modifiability of behavior in infusoria, behavior under natural conditions and habits of feeding. Since attached forms are most favorable for the study of these aspects of behavior, stentor furnishes most of the material of the chapter. The behavior of this simple organism is not stereotyped and invariable as has been supposed by many who have discussed animal behavior without studying it, but alters from moment to moment with changes in external conditions and with those changes in internal conditions which result from experience. "The same individual does not always behave in the same way under the same external conditions, but the behavior depends upon the physiological condition of the animal. The reaction to any given stimulus is modified by the past experience of the animal, and the modifications are regulatory, not haphazard, in character. The phenomena are thus similar to those shown in the 'learning' of higher organisms, save that the modifications depend upon less complex relations and last a shorter time" (p. 179).

The mass of facts concerning the behavior of unicellular organisms presented in this part of the book proves conclusively that they, like higher animals, 'prove all things and hold fast to that which is good.'

Part II. deals with the behavior of certain of the multicellular organisms, the lower metazoa, and especially with that of the cœlenterata, the worms and the crustacea. As representatives of the cœlenterata, the behavior of the fresh-water hydra and of the medusa gonionemus is fully described. The action system of each of these organisms is discussed. To strong stimulation the cœlenterata respond by a contraction

which tends to remove them from the source of a harmful stimulus and to move them toward the source of a favorable stimulus. Locally acting stimuli produce more or less definitely directed movements according to the strength of the stimulus and the structure of the animal. Both hydra and gonionemus have a few definite simple reactions, but where these do not meet the demands of the environmental situation other forms of activity, less stereotyped in character, appear. As the author remarks after describing the rejecting reaction of sea anemones: "This whole reaction is characterized by great flexibility and variability. The débris sets in operation certain activities; if these do not put an end to the stimulation, other activities are induced, till one is successful. This is an excellent illustration of the general characteristics of behavior in the lower organisms" (p. 203).

In this part of the book facts are adduced in support of the statement often repeated by the author that the internal or physiological states of the organism in large measure determine behavior. In the case of the flatworm planaria, six different conditions of the organism are described, each of which has its appropriate forms of reaction. "The different physiological conditions are determined largely by the history of the individual worm, so that in this sense its behavior may be said to depend on its experience" (p. 253). This statement is true of certain of the crustacea also, for it has been shown that the behavior of crabs and crayfish is modifiable and varies with the conditions to which an individual happens to be subjected. This fact is most strikingly demonstrated in the flatform convoluta, for it has been discovered that this worm migrates downward into the sand of the seashore when the tide rises and upward when the tide falls, and further, that this rhythmic change in reaction occurs even when the tidal changes do not affect the animal. In an aquarium this alternation of downward and upward movement continues for about two weeks, so the worm may be said to retain its habit of reaction for this length of time.

Comparing the behavior of the cœlenterata with that of the protozoa, the author writes: "We find no radical difference between the two. In the cœlenterates there are certain cells—the nerve cells—in which the physiological changes accompanying and conditioning behavior are specially pronounced, but this produces no essential difference in the character of the behavior itself. As in the protozoa, so here, we find behavior based largely on the process of performing continued or varied movements which subject the organism to different conditions of the environment, with selection of some and rejection of others" (p. 230).

Part III. consists of an analysis of the facts concerning the behavior of lower organisms of Parts I. and II., with a discussion of certain of the important theories of behavior and interpretations of the facts considered. In the first two parts of the book Professor Jennings has given a strictly objective account of the activities of many lower organisms; in the third part he considers the relations, origin and significance of the features of behavior which are prominent in these organisms.

There is no essential difference, we are told, between the activities of the protozoa and the metozoa; the behavior of one is no more machine-like than that of the other. Even the possession of a nervous system does not change the nature of behavior. Such are the somewhat startling statements with which this part of the book opens.

An examination of the methods of reaction in unicellular organisms indicates that they do not conform to the demands of the 'local action theory of the tropisms.' Instead of reacting to a stimulus which affects different parts of the body unequally by turning directly toward or away from the side stimulated, most of these organisms with varying degrees of thoroughness try different directions and finally select that in which the influence of the stimulus is either increased or decreased, according as the condition is favorable or unfavorable. Precise orientation, as assumed in the local action theory of the tropisms, either does not occur at all or if it does it is brought about by a process of trial and error instead of by the local action of the stimulus. Of the unicellular organisms it may be said that there is no local contraction or expansion on the side of the organism stimulated, but instead a reaction of the animal as a whole.

But the author goes even further in his attack upon the applicability of this theory of the tropisms and attempts to show that it is of little value even as an explanation of the behavior of the lower multicellular organisms. His words on this subject demand quotation. "We must then conclude from our examination of the facts that for the lower organisms taken into consideration in the present work, the local action theory of tropisms is of comparatively little value for interpreting behavior. This theory uses and attempts to make of general application certain elements here and there observable in the behavior of some organisms. But in many organisms even these elements are almost completely lacking, and in no organism that we have taken up does this theory adequately express the nature of behavior. The tropism as applied to animal behavior in the sense we have considered, is not an elementary factor; it is only a more or less artificial construction, made by combining certain elements of behavior and omitting others that are of most essential significance. It makes use of certain simple phenomena that actually exist, but elevates these into a general explanation of directed behavior, for which they are utterly inadequate. The prevalence of this local action theory of tropisms as a general explanation of behavior in lower organisms is based only on an incomplete knowledge and an insufficient analysis of the facts of behavior" (p. 274).

To the question, is the behavior of lower organisms composed of reflexes? a negative answer is given. If the reflex be defined as an act which is invariable, and this is really the only commonly used definition in objective terms that can be accepted in this connection, it is obviously impossible in the light of the facts of Parts I. and II. to maintain that the behavior of any of the unicellular organisms or of the lower multicellular organisms is made up of simple acts which may be classed

as reflex. "The behavior of paramecium and the sea urchin is reflex if the behavior of the dog and of man is reflex . . ." (p. 281). The author, therefore, concludes that the concept of the reflex act as a unit of activity, invariable and unanalyzable, comparable to the atom of physics in certain important respects, is not adequate for the description of the facts of behavior as he finds them.

In chapters on the 'analysis of behavior' the determining factors of behavior, so far as known at present, are discussed in their relations to one another and to the characteristics of the various movements made by lower organisms. These factors are internal and external. Behavior may be determined by any or all of the following five conditions: the present external stimulus; previous stimuli; previous reactions; progressive internal changes; the tendency toward the resolution of physiological states into one another. As a result of analysis "the three most significant features of behavior appear to be (1) the determination of the nature of reactions by the relation of external conditions to the internal physiological processes, and particularly the general principle that interference with these processes causes a change in behavior; (2) reaction by varied or overproduced movements, with selection from the varied conditions resulting from these movements—or, in brief, reaction by selection of overproduced movements; (3) the law of the readier resolution of physiological states after repetition. The first of these phenomena produces the regulatory character of behavior. The second and third furnish the mainsprings for the development of behavior, the second being constructive, the third conservative" (p. 312).

Behavior develops, that is, becomes more effective, more regulatory, in the opinion of the author, by reason of changes in the following directions: (1) increase in delicacy of discrimination; (2) the appearance of reactions to representative stimuli—a stimulus which has no important reaction value becomes the sign of a decidedly beneficial or harmful stimulus and calls forth the reaction which is appropriate to the latter; (3) increase in the complexity and permanency of the modifications produced in the organism by the interaction of external and internal changes; (4) the acquirement of new and more regulatory ways of reacting through selection from among varied movements. "Through the principle of the production of varied movements, and that of the resolution of one physiological state into another, anything that is possible is tried, and anything that turns out to be advantageous to the organism is held and made permanent" (p. 319). Development in accordance with these two principles at times results in the establishment of a fixed response to a certain situation in place of the series of trial movements. Such fixed responses are the reflexes, tropisms, habits and instincts of higher animals. (5) Congenital variations with respect to any of the above changes.

Supposing that the directions of change enumerated should suffice to account for the development of behavior in the individual, how is racial development to be explained? Since the inheritance of acquired characters of behavior has not been proved, this simple method of explanation

is not available, although the author admits that the problem of inheritance can not be considered as settled. Natural selection, guided by individual accommodation, serves to account for certain features of racial behavior. Does it account for all? This question the book does not answer. Instead of attempting it the author shows how natural selection might be supposed to bring about the development of behavior in the race.

Regulation in behavior results from the fact that interference with the physiological processes of the organism brings about varied movements which subject the organism to different conditions, one of which relieves the interference and thus causes the changes in behavior to cease. It is, therefore, clear that the fundamentally important principles of regulation are: (1) selection from among a series of trial movements of the one which relieves the organism of conditions which interfere with the physiological processes, and (2) the stamping in, or fixing, of the successful movement through the readier resolution of physiological states after repetition (p. 345).

Professor Jennings believes that there is no gulf between the behavior of lower organisms and the so-called psychic behavior of higher animals. For few, if any, of the objective characters of the behavior of higher animals are lacking in the behavior which forms the subject-matter of this book. "From the lowest organisms up to a man behavior is essentially regulatory in character, and what we call intelligence in higher animals is a direct outgrowth of the same laws that give behavior its regulatory character in the protozoa" (p. 335).

Concerning the existence of consciousness in lower organisms, it is the author's belief that no amount of increase in our objective knowledge can ever solve the problem for us. The problem of the existence of consciousness beyond the self is indeterminate. At the same time it is his opinion that the objective evidence is in favor of the view that consciousness is generally distributed throughout the animal kingdom. "The writer is thoroughly convinced, after a long study of the behavior of this organism, that if amœba were a large animal, so as to come within the every-day experience of human beings, its behavior would at once call forth the attribution to it of states of pleasure and pain, of hunger, desire, and the like, on precisely the same basis as we attribute these things to the dog" (p. 336).

To complete this objective statement concerning the contents of the behavior of the lower organisms, it should be added that the work is admirably illustrated and has a list of the especially important papers on the subject in point at the end of each chapter, as well as an extensive and valuable bibliography of works on the behavior of lower organisms at the end. There is a very complete index to facilitate reference.

Up to this point this review has been merely a statement, in the words of the author so far as possible, of important points made in the book. Were our consideration of the matter to end here nothing would have been accomplished which the author himself could not have done much better. We shall, therefore, turn now to a brief discussion and criticism of the work.

There are two results of Professor Jennings's studies which appear as the central thoughts of the book. One of these is the fact that the behavior of lower organisms is complex, variable and frequently of the trial and error sort instead of being, as has usually been supposed heretofore, simple, invariable and unmodifiable. The other fact is that the local action theory of the tropisms, which has been so extensively used to account for the reactions of lower organisms, does not agree with the facts of behavior in most of the unicellular organisms and in many of the lower multicellular animals, for instead of orienting directly and precisely with reference to a given stimulus by reason of the local action of the stimulus, they usually exhibit a series of trial movements which are the result of the activity of the organism as a whole. The importance of these two general conclusions of the book has not been overemphasized by the author, although he has built his entire work about them and has used all his materials of fact to justify them.

It can not be said that the investigations which have led to these conclusions were entered upon with a prejudice in favor of them, for when the author began his work on the 'Reactions to Stimuli in Unicellular Organisms,' just ten years ago, he laid stress upon the possibility of reducing the seemingly complex activities to simple and relatively uniform acts and used terms in the description of the reactions of the organisms which justify the inference that he believed in the satisfactoriness of the local action theory of the tropisms. But during the ten years between the beginning of his researches and the writing of the 'Behavior of the Lower Organisms,' the accumulation of facts has led to a gradual change in the author's opinion on these matters. To-day he strongly opposes the view that behavior is composed of invariable reflexes which are often determined by the local action of a stimulus.

With reference to the two chief points of the book, the following criticism may be offered. Too little emphasis is given the fact that in many cases what appears to the observer to be a series of trial movements is really the repetition of a certain act. The external effect of the repetition is not precisely the same each time, for the organism is constantly being brought into new relations to its environment. One can not help asking, after all is there not some fundamental difference between the so-called trial movements of unicellular organisms and the trial and error behavior of higher animals?

It is by no means clear that the local action of a stimulus may not give origin to a series of movements which have all the characteristics of trial movements. Orientation to a stimulus, even by local action, is not in all cases precise; the organism moves too far and has to change the direction of motion, or, perhaps because of a conflict of stimuli, it starts to move in the wrong direction. It may well be asked whether the author's opposition to the local action of stimuli may not lead inexperienced investigators to think that all reactions are of the trial and error type. Possibly it would have been better had certain instances of reaction without trial been given greater prominence. Professor Jen-

nings has not disproved the existence of local action: he has shown that the behavior of many of the lower organisms in certain instances need not, and in other cases can not, be explained on the ground of such action. It remains for some one to determine whether a stimulus ever brings about a movement by local action instead of by changing the condition of the entire organism.

Unforunately, the author has not dealt rigorously and in an original manner with the concept of reflex action. The definition which he accepts for purposes of description—an invariable reaction to a stimulus—is obviously unsatisfactory, for if one thing is plain it is that no organic reaction is invariable. Had he either formulated a definition in terms of the results of his investigations or simply said there is no such thing as reflex action as commonly conceived and then proceeded with his careful analysis of behavior, there would have been greater gain. The upshot of the whole matter is that Professor Jennings has no unit of action and apparently is not very hopeful of finding one. He has shown that those acts which are commonly called reflex are far from being simple, in many cases, and are never invariable. The question remains, is there a simple, unanalyzable organic process which may be used for descriptive purposes as a unit of action?

By his researches Professor Jennings has made himself the authority on the behavior of unicellular organisms. His book is admirable with respect to material, method of presentation and form. Its present importance can be fairly judged only when one realizes that it undermines the prevalent conception of the nature of the behavior of lower organisms and narrows to a fraction of its present reach the applicability of the most influential theory of the reactions of lower organisms that has ever been proposed. Its future influence will certainly be tremendous, for it is a work which will determine the direction of research as well as mould popular and scientific opinion. It is the most important book on animal behavior that has ever been written.

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The Psychological Principles of Education. HERMAN HARRELL HORNE, Ph.D. New York: The Macmillan Company. 1906. Pp. xiii + 435.

Considering the present stage of psychological science, Professor Horne has essayed a hazardous task. Though not seeking to contribute to pure psychology nor to special educational methods, he does attempt to deduce practical applications and to criticize educational errors by what he conceives to be ascertained and verifiable laws of mind.

There are five main divisions of the book, the thirty-four chapters, however, being numbered consecutively. Part I. is concerned with the general presuppositions of the science of education, being a revision of his discussion of this topic at the World's Congress of Arts and Sciences at St. Louis. The author pleads for a recognition of education as a science, while admitting that it is primarily an art. Accepting history

as a science, by analogy education should be. Contrary to Professor Royce, 'universal validity' is not an 'inalienable characteristic of science.' A 'relative,' not an 'absolute pedagogy,' with a growing, not a static ideal, is indeed a normative science, more and more accumulating a 'body of growing knowledge, classified and verifiable.' Thorndike's work is cited as an example of the advancement and rigor in application of exact scientific methods to the problems exclusively educational. Results at present are meager, methods must be perfected and limitations more strictly defined. The pace has been set, however.

In the body of the book one finds a series of attempts to illustrate the desirability and the practicability of 'this transformation of psychological science into pedagogical art.' In the past egregious errors, such as the extravagant insistence upon formal discipline, the undue stress upon memory, etc., were due to the mistaken faculty school of psychologists. Functional and genetic psychology now emphasize safer and more desirable ways of treating the most clearly revealed stages in mental development and organization. Further, emphasis is laid on the necessity of prime consideration for the teachers, *viz.*, that they should appreciate the needs of the growing, even more than of the grown, mind. Thus paving the way, the author in the remainder of the book (Parts II., III., IV. and V.) concerns himself with specific illustrations of how consciously the teacher should use his psychological laws in the actual intercourse of school life, prefacing his specific work with a closing chapter in Part I., in which the theory of formal discipline serves to illustrate how illuminating comprehensive psychological attitude and analysis can be not only in detecting, but in efficiently correcting educational extremes in matters of emphasis.

Part II. treats of intellectual education. In substance, we as teachers have laid undue stress upon certain sensory material, auditory once, visual at another period, and have never quite sufficiently sought for the attainment of the harmonious functioning of our whole sensory apparatus. Seeking also chiefly what contributes primarily to intellectual clarity, certain other sense organs which furnish us chiefly with esthetic material we have complacently neglected. The author goes to the extreme of urging that a definite effort be directed to the rehabilitating of our rudimentary olfactory sense. It is interesting here to compare his position with that of another prominent educational psychologist. Bagley, in his 'Educative Process' (page 52), deplores the very attitude voiced by the above writer. "The harmonious development aim has taken another erratic turn in giving undue prominence to 'sense training,' especially as applied to the lower senses. . . ." "Now the sense of smell has been atrophied in man for a very good reason. . . ."

The other chapters in Part II. deal with the nature, and the principles of application deduced therefrom, of perception, apperception, memory, imagination, conception, judgment and reasoning. Fads are attacked, errors due to faulty psychological concepts are exposed, and suggestions of conditions for the teacher's equipment and for the pupil's appreciative understanding are carefully enumerated and psychologically justified.

Part III. is concerned exclusively with what pertains to the principles of 'educating the mind to feel.' The striking thing in this chapter is the contention that the training of the feelings should be the conscious, definite aim of the teacher, and that our affective experience is also amenable to methodical exercise. This, however, constitutes the chief value of the treatment for the psychologists as such. The details of the discussion here reveal the author's ethical rather than his psychological acumen. His description, classification and partially adverse criticism of modern theories of feeling are not exhaustive nor do they constitute a satisfactory résumé of the even now 'darkest chapter in psychology.' The concluding chapter on 'Esthetic Education' is naturally nearer to modern psychological issues. His practical suggestions are good and timely.

Part IV. deals with the function, importance, nature and development of the will. Using will in the broad sense, the author includes spontaneous, reflex, instinctive, impulsive, imitative, suggested, habitual and attentive or chosen action as serviceable types, all but the two first named falling under the influence of the educator, and all likewise amenable to a psychological plan of development. Using James's types of wills, the writer claims that our modern kindergarten is adapted to the development of the 'obstructed,' but fashioned so as to be actually detrimental to the equally common type of 'precipitate' will. This, however, is but a sample of the many short-sighted educational policies, cited continually throughout the book, adopted unadvisedly by our educational system builders, whose point of view is limited by their correspondingly limited psychological horizon. There follows a decidedly interesting ethical discussion. The concluding topic of Part IV. deals with attention. A teacher with sufficient psychological erudition and insight will not exclusively follow the child's unguided interest, nor unreservedly call for effort, two marked extremes from the one to the other of which, again from lack of psychological balance, the educational pendulum still continues to swing.

Part V., the concluding division of the book, deals with the problem of the religious consciousness, and the legitimate and practical means for its development. The psychology of religion has also its message for the educator. James, Starbuck, Leuba, Höffding, Hall, Coe, Martineau and many others are drawn upon, with the purpose in view of showing, from the organic nature of self, and from the teachings of genetic psychology, the logical and natural last step of consciously directed educational effort. This from scientific grounds must be incorporated into our educational ideals. Without this specific recognition, based on psychological as well as on ethical and religious assurance, the efforts of education are but makeshifts, futile as tested by the only norm our developed national consciousness should recognize. Religion, in other words, is not 'an artificial graft into human nature,' nor is it merely the 'safe passing of an adolescent crisis.'

A criticism from a strictly psychological point of view is hardly ap-

plicable, since the author disavows any intention of contributing to the science. However, the psychologist is naturally interested also in what can be successfully taken over into practise from his chosen field of investigation and experimentation; and it is true also that many look askant at such endeavors as premature and as relying upon questionable speculation rather than upon approved and established fact.

Again the necessity of rather dogmatic and brief summaries and definitions of mental processes tends often to show haste and lack of scientific exactness in their formulation. For an example of this, on pages 166–7 we read: "A sensation is a response of intelligence to stimulation; perception is the repeated response of intelligence to sensation; conception is the response of intelligence to repeated perception; memory and the reproductive imagination are the response of intelligence to its past; and the productive imagination is the response of intelligence to the future or to ideal values." Besides the failure here adequately to represent the immense complexity of the processes referred to, the account may be construed as even misleading. It would be profitable here again for the student of the book to compare the above cited paragraph with the description given by W. McDougall of the same processes, in his excellent little book, 'Physiological Psychology.' Every phrase of the above would be essentially modified. To quote once more, such statements as we find on page 195, "The nerve-centers that correspond to feelings develop earlier than those that correspond to rational thought and deliberate action, . . ." and on page 259, "The roots of will are very much lower down in the nervous system of man than we ordinarily suppose," might lead the trusting reader, uninitiated into the unsettled state of present neurological inquiry into the functions of higher and lower centers, to conclude that our knowledge is much further advanced than actually is the case.

Notwithstanding these and other similar criticisms that might be offered, the author's purpose as outlined in his preface is never compromised. If his title is not taken too literally, if the reader is willing to admit the inclusion of ethical and religious considerations, not to be too insistent that the treatment indicate one consistent attitude, the book is likely to prove profitable and entertaining. Educational factors are varied and widely dispersed, poorly organized, wrongly directed, and some of them often entirely overlooked. This the author sees, and for this he seeks the principles of correction, wherever they seem most likely to be found. He has stressed the importance of the science of psychology, but quite frankly states as another prefatory remark that valuable contributions are looked for from the other sciences as well, though not perhaps in the same proportion.

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JOURNALS AND NEW BOOKS

REVUE PHILOSOPHIQUE. October, 1906. *Les conditions biologiques du remords* (pp. 337–358): G. DUMAS. – Abnormal cases of remorse show that the emotion is present in patients who have lost normal feelings and ambitions, and who yet belong to the active type of melancholiacs. The instincts leading to the act remorsefully viewed have perished, at least temporarily, and the act is judged in abstraction from its impulse. There is a physiological disturbance giving a conscious depression which attaches to an intellectual content. Removal of the depression removes the remorse; one grain injection of caffeine accomplished this in one case recorded. *L'échange économique et l'échange affectif* (pp. 359–399): F. PAULHAN. – The basic difference between economic and sentimental exchange is that the former is definite while the latter is indefinite. In the latter there is no specific quantity of demanded and supplied goods, but merely a demanded and supplied attitude. The sentimental exchange is a relatively permanent contract, whereas the economic one is occasional. Affections have economic value, but this is hard to fix. Every economic exchange involves some affective relation between the parties. Affective exchange tends to become definite; as soon as it becomes so it is only a special form of economic exchange. *L'a priori dans la science* (pp. 400–411): W. M. KOZLOWSKI. – The problem of science is (*a*) to decide between appearance and reality, and (*b*) to discover the nature and origin of scientific theory itself. Mach's theory of the accidental, purely historical nature of modern scientific hypotheses is wrong because it assumes that the mind is a *tabula rasa*. But the scientist, like the ordinary man, has a psychological equipment prior to all theoretical thinking. So in science we have two species of *a priori;* the historical and the psychological. Scientific antinomies are between qualitative (perceptual) and quantitative (rational) aspects of reality. Tables of these antinomies and their solutions are given. *Revue critique:* Rignano, *Sur la transmissibilité des caractères acquis:* LE DANTEC. Lacombe, *La psychologie des individus et des sociétés chez Taine:* PAULHAN. *Analyses et comptes rendus:* Jerusalem, *Der kritische Idealismus und die reine Logik:* LUQUET. Dugas, *Cours de morale théorique et pratique:* M. X. Goldscheid, *Grundlinien zu einer Kritik der Willenskraft:* SEGOND. Caviglione, *Il rimorso:* SEGOND. Cimbali, *La cittá terrena:* SEGOND. Gerland, *Immanuel Kant, seine geographischen und anthropologischen Arbeiten:* SEGOND. Immanuel Kant, *Grundlegung zur Metaphysik der Sitten:* SEGOND. Falter, *Beiträge zur Geschichte der Idee:* HUIT. *Revue des périodiques étrangers.*

Croce, Benedetto. *Aesthetik als Wissenschaft des Ausdrucks und allgemeine Linguistik.* Theorie und Geschichte. Nach der zweiten durchgesehenen Auflage aus dem Italienischen übersetzt von Karl Federn. Leipzig: Verlag von E. A. Seeman. 1905. Pp. xiv + 494.

Johnson, Edith Henry. *The Argument of Aristotle's Metaphysics.* New York: Lemcke & Buechner, Agents. 1906. Pp. 186.

Ribot, Th. *Essai sur les passions.* Paris: Félix Alcan. 1906. Pp. vii + 192. 3 fr. 75.

Talbot, Ellen Bliss. *The Fundamental Principle of Fichte's Philosophy.* Cornell Studies in Philosophy, No. 7. New York and London: The Macmillan Co. 1906. Pp. vi + 140. $1.00 *net.*

Zschimmer, Eberhard. *Eine Untersuchung über Raum, Zeit und Begriffe vom Standpunkt des Positivismus.* Leipzig: Wilhelm Engelmann. 1906. Pp. 54. 1s. 6d. *net.*

NOTES AND NEWS

CHARLES A. OLIVER, A.M., M.D., contributes in the *New York Medical Journal* of November 10 a study of the 'nativity, sex and age, occupation and social condition of three thousand four hundred and thirty-six cases of senile cataract operated upon at the Wills Hospital in Philadelphia.' The operations were performed by the various members of the attending staff and covered a period of thirty-five years. The cases employed were limited so far as possible to those in which the 'usual clinical appearances of so-called senile cataract were not complicated by any other demonstrable expressions of cause and effect than those which are significant of the gradual retrograde changes denominated by senility.' The following is an extract from the statistics given: "*Nativity:* It has been found that there were fifteen hundred and thirty-five foreign-born cases and nineteen hundred and one native-born ones. Of the foreign-born groupings, Ireland furnished the greatest number throughout the three and a half decades; actually rising to some fifty-five per cent. This was closely followed by Germany with thirty and some per cent., England with ten per cent. and Wales and Scotland with three and two per cent., respectively. Among the native-born, Pennsylvania, with its preponderant sixty-five per cent., naturally gave a long lead, followed by fifteen per cent. for New Jersey, ten per cent. for Delaware and five per cent. each for Maryland and New York. *Sex and age:* With the native-born male American there existed the highest average age for operation, and hence most probably that of maturity of his cataract. During the first decade it was 64.5 years, increasing one tenth to 64.6 years for the second decade and rising another tenth (64.7 years) in the third decade—until in the first half of the last decade (to date) it has arisen to the remarkable average of 67.6 years. The Irish male, commencing at 61.7 years, falling two tenths (61.5 years) in the second decade, and rising four tenths (61.9 years) in the third, showed a final increase of six tenths (62.5 years) in the last half decade. The male German, beginning lower, at 60.6 years, gave a rise to 60.9 years in the second decade, with a sudden jump to 64 years in the third—to which he finally added eight tenths of a year

(64.8 years). The Englishman and the Scotchman at 60 years and 59 years each, rose to 63.5 years and 60 years, with a rise of the former to 65.3 years and a fall of the latter to 58 years—to at last give the phenomenal jumps of 70 years and 71 years respectively. Among seven hundred and thirty native-born women, forming about fifty per cent. of the total of fourteen hundred and fifty-two female cases in the series, it was found that the average operation age during the first decade was 63.1 years, increasing in the second decade to 65.4 years, and decreasing in the third decade to 64.3 years; ultimately rising in the last five years to 63.8 years; thus giving an increase of seven tenths of a year as the general average. The Irish female ratio increased regularly through the four decades from 60 years to 60.8 years, to 62.1 years, and to 63.2 years as the final average; a very marked gain in the proportion. The German female, commencing with 62 years, fell to 60.8 years in the second decade, to rise to 63.9 years in the third, and to give an enormous leap to 68.5 years as the average for the last half decade; a most remarkable betterment. The English woman and the Scotch woman, commencing at 62 years and 64 years, respectively, suddenly rose to 64 years and 73 years each, to again fall very low, 62 years and 60 years each, but ultimately to reach 63.2 years as the final for the former, with a remarkable jump to 73 years as the final for the latter. *Occupation:* It was soon realized that as occupation among the male subjects played such an important part in regard to the maturity and even causation of the cataractous condition, it was necessary to divide the patients' vocations into four classes: (*a*) the unskilled laborer, (*b*) the skilled workman, (*c*) the high-grade artisan, (*d*) the brain-worker. The first great class, (*a*), composed principally of out-of-door laborers, although by far the greatest in number, gave the highest operative age average, sixty-six years, throughout the entire three and a half decades; the average practically remaining the same. The second class, (*b*), made up of blacksmiths, glass blowers and other workers in superheated materials, gave by far the lowest age for the operative procedure, fifty-eight years. The third class, (*c*), composed of those in such employment as book binders, compositors, edge-tool makers, engravers, jewelers, shoemakers (particularly) and tailors, showed the lenticular condition fit for removal at an average age of sixty-three years. The fourth class, (*d*), most probably by reason of better hygiene, etc., gave a very high operative age, sixty-five years, as the average."

THE following appointments have been made in the department of philosophy in the University of Michigan: Mr. Roy W. Sellars, A.B. (Michigan), some time fellow of the University of Wisconsin, instructor, and Mr. Frank van Vliet and Mr. L. W. Elder George S. Morris memorial fellows.

DR. FREDERICK TRACY has been promoted to an associate professorship in the department of philosophy in the University of Toronto, and Dr. T. R. Robinson and Mr. W. G. Smith have been added as lecturers to the staff of the department.

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